Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	IB Docket No. 95-91
Authorization of Satellite Digital Audio	)	
Radio Service Terrestrial Repeaters Network	)	DA No. 01-2570

COMMENTS OF THE NATIONAL ASSOCIATION OF BROADCASTERS

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SUMMARY

The National Association of Broadcasters hereby files comments in response to the International Bureau's request for comment on issues surrounding the permanent authorization of terrestrial repeaters networks used to supplement Satellite Digital Audio Radio Service ("SDARS") systems. In authorizing SDARS service in 1997, the Commission stated that the sole purpose of terrestrial repeaters was to overcome "effects of signal blockage and multipath interference." The Commission stated that it would require that the signals being transmitted by the repeater be received from the DARS satellite. The Commission also tentatively concluded to bar SDARS repeaters from transmitting locally-originated programming. The intent of the Commission is undisputed – terrestrial repeaters should be used only to reach areas where a satellite signal cannot reach. And in crafting permanent service rules for terrestrial repeaters, the Commission should adopt clearly defined language to ensure that the *same programming* is being transmitted at the *same time* throughout the entire SDARS networks.

The SDARS licensees, however, have proposed a definition for authorized transmission which is anything but clear. The terms "such a way" and "nearly simultaneous" provide little guidance as to what constitutes a permissible or authorized transmission, how that transmission must be routed, and whether or not content can be downloaded from a satellite and stored on a terrestrial repeater for a subsequent or delayed airing. Further, the proposed definition does not preclude locally-originated material. The Commission should not adopt the SDARS proposed definition. Instead, the final service rules should the no-local origination clause in the Special Temporary Authorities granted to the SDARS licensees.

Further, *all* incumbent services should be protected against blanketing interference caused by SDARS terrestrial repeaters. NAB is particularly concerned about potential interference to Broadcast Auxiliary Service ("BAS") operating in the 2 GHz bands adjacent to the SDARS repeaters. This is

because, even though the Commission will require SDARS repeaters to suppress their out of band emissions, the suppressed signal level will still be substantially above the overload threshold low noise amplifiers in BAS receivers. Therefore, the Commission should require SDARS repeater licensees to also engage in full frequency coordination with BAS licensees and other licensees and to remedy all complaints of interference at no cost to the incumbent licensees. If, however, technical specifications and repeater locations are unknown, the injured licensee *has no ability* to ascertain which facility or facilities are causing interference. Thus, in order to accomplish such frequency coordination and remedy interference caused by the SDARS terrestrial repeaters, their location and operating parameters must be made part of the public record.

Finally, the Bureau seeks comment on how it should address a request from SDARS licensees to increase the power limit over which they must perform a routine environmental evaluation of a repeater facility's compliance with the Commission's RF safety regulations. There is no scientific basis for treating SDARS repeaters differently from any other terrestrial microwave facilities operating in the same frequency band.

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To: Chief, International Bureau

COMMENTS OF
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I. Introduction and Background.

The National Association of Broadcasters ("NAB")[1] submits these comments in the above-captioned proceeding. Six years ago, applicants for Satellite Digital Audio Radio Service ("SDARS") licensees advocated service rules for the operation of "terrestrial repeaters, or 'gap-fillers', in urban canyons and other areas where it may be difficult to receive DARS signals transmitted by a satellite." Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Notice of Proposed Rulemaking*, 11 FCC Rcd 1 (1995) at ¶¶ 55-56. At that time, the Commission declined to propose rules for terrestrial repeaters, citing the applicants' failure to provide detailed information and commenting that "[u]ntil such information is available and applicants demonstrate how these complementary terrestrial networks would be implemented in the overall satellite system design,

[1] NAB is a non-profit, incorporated association of radio and television stations and broadcast networks which serves and represents the American broadcasting industry.

[the FCC] cannot determine if terrestrial gap-fillers should be permitted and what rules should govern their use." *Id.* The Commission also determined *that gap-fillers would only be complementary to satellite service* – thus, the Commission proposed to prohibit the use of terrestrial repeaters "except in conjunction with an operating satellite DARS system." *Id*. at ¶ 56. Two years later, the Commission issued a *Report and Order* authorizing SDARS service and requesting further comment on the use of terrestrial repeaters. Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band *Report and Order, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 12 FCC Rcd 5754 (1997) at ¶ 138 ("*Report and Order/Further Notice*").

Even in the absence of service rules, the SDARS licensees began to build a national network of repeaters by way of a series of experimental authorizations. Initially, the Commission granted several of these experimental authorizations without public notice or comment.[2] But, in January 2000, the Commission issued a public notice on XM Radio, Inc.'s ("XM") request for Special Temporary Authority ("STA") to build terrestrial repeaters.[3] The STA was granted in August 2000.

Nearly one year later, both XM and Sirius Satellite Radio, Inc. ("Sirius") requested STAs to commence commercial operation of their terrestrial repeater networks.[4] On September 17,

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[2] *E.g.*, Experimental Radio Station Construction Permit and License, File No. 0013-EX-TC-2000, XM Radio, Inc., granted Aug. 25, 2000; Experimental Radio Station Construction Permit and License, File No. 0160-EX-ML-2000, XM Radio, Inc., granted Aug. 23, 2000.

[3] Satellite Policy Branch Information, Public Notice, IB Docket No. 95-91 and GEN Docket No. 90-357 (issued Jan. 21, 2000). XM's STA request was granted on Aug. 1, 2000 (Experimental Special Temporary Authorization, File No. 0271-EX-ST-2000).

[4] Letter from Lon C. Levin, Senior Vice President, XM to Magalie Roman Salas, Secretary, FCC, July 12, 2001 (requesting STA for 168 terrestrial repeaters operating at EIRP between greater than 10 kW and 40 kW and 610 terrestrial repeaters operating at EIRP between greater than 2 kW and 10 kW); Letter from Robert D. Briskman, Technical Executive, Sirius to Magalie

2001, the Commission granted XM and Sirius' requests.[5] The current STAs will expire on March 18, 2002, or upon implementation of permanent service rules, whichever occurs first.[6] The International Bureau now requests comment on issues surrounding the permanent authorization of terrestrial repeater networks. Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Request for Further Comment*, IB Docket No. 95-91 (rel. November 1, 2001) ("*Notice*"). As discussed below, NAB urges the Commission to adhere to the no-local origination clause in the current STAs, explicitly prohibit locally-originated programming on terrestrial repeaters, insure that all incumbent licensees are protected from blanketing interference and be consistent in the application of RF safety regulations.

II. The Final Service Rules Must Explicitly Prohibit Local Origination.

In the *Report and Order* authorizing SDARS service, the Commission stated that the sole purpose of terrestrial repeaters is the retransmission of information from the satellite signal in order to overcome "effects of signal blockage and multipath interference." *Report and Oerder/Further Notice* at ¶ 138. At that time, the Commission stated that rules governing SDARS use of terrestrial repeaters would require that the signals being transmitted by the repeater be received from the operating DARS satellites; the Commission also "tentatively concluded" to prohibit SDARS repeaters from transmitting locally-originated programming. *Id.*

Roman Salas, Secretary, FCC, July 24, 2001 (requesting STA for 151 repeaters at 104 sites operating at EIRP between greater than 2 kW and 40 kW) ("*STA Requests*").

[5] XM, Radio., Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complimentary Terrestrial Repeaters, *Order and Authorization*, DA 01-2172 (rel. September 17, 2001) ("*XM STA Order*"); Sirius Satellite Radio Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complimentary Terrestrial Repeaters, *Order and Authorization*, DA 01-2171 (rel. September 17, 2001) ("*Sirius STA Order*").

at ¶¶ 140-42, 144. The Commission reaffirmed both the limited purpose and restriction on the use of terrestrial repeaters. *Notice* at 1. Thus, the Commission's intent is undisputed – terrestrial repeaters should be used only to reach areas where a satellite signal cannot reach. As discussed below, however, adoption of vaguely defined service rules could allow circumvention of this intent.

XM and Sirius have consistently proposed vague language which does not preclude locally-originated programming on terrestrial repeaters. Beginning in January 2000, Sirius advocated replacing the Commission's proposed requirement that the signals being transmitted by the repeater be received from the operating DARS satellites with language that repeaters simply retransmit the "same programming" as the DARS satellite.[7] That definition would have permitted unlimited time shifting of programming so that different programs streams could be fed to repeaters at off hours. One year later, XM and Sirius proposed that the rules be crafted so that "[t]errestrial repeaters shall not be used to originate programming not also transmitted from authorized DARS satellites."[8] That definition would also have permitted listeners to receive different programming from a repeater than they could from the satellite, so long as the satellite had been used to feed the repeater at some point. And in September 2001, XM and Sirius proposed the following definition for authorized transmissions:

> SDARS repeaters shall be used only to transmit the complete programming, and only that programming that is also transmitted by an authorized DARS satellite and in such a way

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[6] *XM STA Order* at ¶ 18; *Sirius STA Order* at ¶ 18.

[7] *See* Supplemental Comments of Sirius Satellite Radio, January 18, 2000, at Exhibit 3; *see also* Comments of NAB, Feb. 22, 2000 at 3-4.

[8] *See* Proposed Rule §25.144 (e)(1), XM's *Ex Parte Submission*, IB Docket No. 95-91, April 25, 2001 and Proposed Rule §25.144 (e)(1), Sirius' *Ex Parte Submission*, IB Docket No. 95-91, April 23, 2001.

that the satellite signal and the terrestrial repeater signal are received nearly simultaneously by SDARS subscriber receivers.[9]

In crafting permanent service rules for terrestrial repeaters, the Commission should adopt clearly defined language to ensure that the *same programming* is being transmitted *at the same time* throughout the entire SDARS networks. This latest SDARS licensees-proposed language, however, is anything but clear. The terms "such a way" and "nearly simultaneous" provide little guidance as to what constitutes a permissible or authorized transmission, how that transmission must be routed, and, whether or not content can be downloaded from a satellite and stored on a terrestrial repeater for a subsequent or delayed airing. If the intent of the SDARS licensees in proposing the "nearly simultaneous" language is only to recognize the transmission delays that may be inherent in differing transmission paths, the language goes too far and allows for more flexibility than necessary. The Commission can make clear that the repeater rule would not be violated by transmission delays inherent in time differences resulting from RF propagation delay differential, due to one transmitter being terrestrial (the repeater) and the other being a satellite, or other system design attributes such as time diversity,[10] so long as all programming was transmitted from the SDARS uplink facility simultaneously to all transmitters, satellite or terrestrial.[11]

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[9] Letter from Carl Frank, Counsel for Sirius, and Bruce D. Jacobs, Counsel for XM, to Magalie Roman Salas, Secretary, FCC, Sept. 26, 2001, at 5.

[10] Time diversity is a signal processing technique in which the same information is sent over two different paths but with a short, fixed time delay between them (typically on the order of four seconds). SDARS licensees have indicated that their systems utilize time diversity to improve robustness in the presence of signal blockage.

[11] Alternatively, the Commission could prohibit the storing of programming on terrestrial repeaters in a separate section of the final service rules. The Commission has previously bifurcated terms and separately defined them when it "believes it is more precise and will provide clearer guidance." Implementation of Sections 255 and 251(a)(2) of the Communications Act of 1934, as Enacted by the Telecommunications Act of 1996; Access to

Further, as NAB has previously stated, it is technically feasible for XM and Sirius to transmit programming coded in such a way that it would not be processed by the satellite signal portion of consumer receivers, but instead would be received and stored in memory residing within the terrestrial repeater.[12] Programming could be targeted to specific repeaters and have local content. This potentially locally-oriented material could then be transmitted to a consumer receiver. Although this latest proposed definition of an authorized transmission appears to echo the SDARS pledge not to transmit locally-originated programming, upon closer examination, it *does not preclude locally-originated material* and, as such, contravenes the Commission's tentative conclusion to prohibit the use of terrestrial repeaters to transmit locally-originated programming.[13] Specifically, the proposed language is not a prohibition on locally-originated material (as it should be). Instead, it is merely a confirmation that material transmitted from terrestrial repeaters is also transmitted by the SDARS satellite.

Thus, the use of the hazy term "nearly simultaneous" could promote the subversion of a uniform and national service into a distribution network of locally-differentiated content. Webster's Dictionary defines *nearly* as (1) all but; almost: (2) with close approximation or (3) with close kinship, interest, or connection; intimately. Random House Webster's College

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Telecommunications Service, Telecommunications Equipment and Customer Premises Equipment by Persons with Disabilities, 64 FR 63235 (1999) at ¶ 23 (in which the FCC decided to separately define the terms "usable by" and "accessible to").

[12] This capability stems from the fact that SDARS consumer receivers are in fact two receivers in one – a satellite receiver (which processes the single-carrier TDM transmission from the satellite) and a terrestrial receiver (processing the multi-carrier OFDM terrestrially-transmitted signal).

[13] *Further Notice* at ¶¶ 140-142; s*ee also* Comments of NAB, In the Matter of XM, Radio, Inc. and Sirius Satellite Radio, Inc., Requests for Special Temporary Authority To Operate Digital Audio Radio Service (DARS) Terrestrial Repeaters, IB Docket No. 95-91 (Aug. 21, 2001) at 11-13.

Dictionary (1999 Second Edition). Under XM and Sirius' definition of an authorized transmission, locally-originated programming inserted on terrestrial repeaters could arguably be construed as "nearly simultaneous" because the content transmitted over the repeaters would be simultaneous "all but" for a percentage of programming that was downloaded from the satellite, stored on a terrestrial repeaters, and subsequently transmitted to a receiver.

In lieu of XM and Sirius' proposed language, NAB urges the Commission to incorporate into the final service rules the no-local origination clause in the current STAs:

> SDARS repeaters are restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to the SDARS subscriber's receivers.

XM STA Order at ¶ 18, *Sirius STA Order* at ¶ 18. The Commission should make clear in its service rules that repeaters be used and are restricted to re-transmitting only what is currently being broadcast by the SDARS satellite, and that input to these repeaters be restricted to the SDARS satellite signal itself.[14] No other input, backup or otherwise, should be allowed. By incorporating the conditions set forth by the STAs, the Commission would reaffirm its original intention in this rulemaking – the establishment of a satellite-only radio service.

III. All Incumbent Services Should Be Protected From Blanketing Interference Caused By SDARS Repeaters.

Previously, the Commission proposed to license SDARS repeaters on a blanket basis (multiple repeaters under a single authorization). *Report and Order*/*Further Notice* at ¶¶ 138-42.

[14] The Commission states, *Report and Order*/*Further Notice*, *supra,* at ¶ 142, that it "must determine how to ensure any use of terrestrial repeaters is complementary to the DARS service and is only for retransmission of signals received from the satellite." Given the highly problematic task of the Commission's physically verifying that every repeater is being fed only from an authorized satellite, the Commission's rules must *explicitly* require such operation, as the Commission required in the STAs.

In light of the potential blanketing interference to Wireless Communications Services (WCS), the Bureau seeks comment on a proposed compensation methodology for SDARS licensees to pay for the components necessary to eliminate interference to WCS licensees. *Notice* at 3-8. The Bureau also seeks comment on whether it should extend compensation to Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS") licensees which may also be susceptible to blanketing interference from SDARS repeaters. *Id*.

SDARS licensees should be required to bear the full financial responsibility to remedy all blanketing interference that low power repeaters and high power repeaters cause to MDS and ITFS facilities. Further, because of the extraordinary transmit power proposed for SDARS repeaters, the proposed compensation requirement should extend to *all* incumbent terrestrial microwave facilities. SDARS licensees should have a requirement similar to that of FM broadcast stations,[15] *i.e*., the SDARS repeater service rules should expressly state that licensees are required to resolve *all* complaints of blanketing interference received from *any* incumbent licensee in any service for a designated period of time.

NAB is particularly concerned about potential interference to Broadcast Auxiliary Service ("BAS") facilities operating in the 2 GHz bands adjacent to the SDARS repeaters.[16] These facilities are used to support Electronic Newsgathering ("ENG") and are the means by which live, on-the-spot news coverage is relayed from a news scene back to a TV studio for broadcast. These 2 GHz BAS receivers are as susceptible to interference from SDARS repeaters – particularly high powered receivers – as are WCS, and MDS/ ITFS facilities in the 2.3 GHz band. This is because, even though the Commission will require SDARS repeaters to suppress

[15] 47 C.F.R. §73.318.

[16] *See* 47 C.F.R. §74 subpart F. BAS facilities operate in the 1990 – 2110 MHz band and the 2450 – 2500 MHz band.

their out of band emissions,[17] the suppressed signal level will still be substantially above the overload threshold low noise amplifiers in BAS receivers.[18] Therefore, the Commission should require SDARS repeater licensees to also engage in full frequency coordination with BAS licensees and to remedy all complaints of interference at no cost to the BAS licensees.[19]

In order to accomplish such frequency coordination and remedy interference caused by the SDARS terrestrial repeaters, their location and operating parameters must be made part of the public record. If technical specifications and repeater locations are unknown, the injured licensee has no ability to ascertain which facility or facilities are causing interference. Thus, NAB strongly urges the Commission to require public disclosure of the location and operating parameters of each existing and future SDARS terrestrial repeater.

IV. Radio Frequency (RF) Safety.

Finally, the Bureau seeks comment on how it should address a request from SDARS licensees to increase the power limit over which they must perform a routine environmental evaluation of a repeater facility's compliance with the Commission's RF safety regulations.[20]

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[17] *Notice* at 3.

[18] For example, the Low Noise Amplifier ("LNA") in the antenna of a typical BAS receiver will overload at the -10 to -20 dbm signal level, depending on the age and manufacture of the LNA. The *Notice* proposes to require SDARS repeaters to attenuate their out of band emissions by a factor not less than 75 +10Log(P in watts)dB. *Notice* at 8. For a 2 kW (63 dBm) LRP that attenuation would be: 75+ 10log(2000W) = 108 dB. The received interference level into a BAS receiver that is in close physical proximity to such a low power repeater would be: 63 -108 + 26 (BAS antenna gain) + 5 (SDARS antenna gain) = -14 dBm. This signal level will likely overload the BAS LNA.

[19] This can be accomplished by working with the local broadcast frequency coordinator in each market. A list of the frequency coordinators is available at www.sbe.org.

[20] This power limit is contained in table 1 of Section 1.307. Facilities that do not meet the conditions set in table1 are "categorically excluded" from performing a routine evaluating the facility's compliance with the Commission's RF safety rules.

SDARS licensees seek to increase that threshold from 1640 watts equivalent isotropically radiated power ("EIRP") to 2000 watts EIRP. The 1640 watt EIRP limit is a calculated value based on the Maximum Permissible Exposure ("MPE") limits contained in the Commission's RF safety guidelines.[21] Those MPE limits are based on solely on a facility's transmitted power, its frequency band and the distance from the transmitter. There is no scientific basis for treating SDARS repeaters differently from any other terrestrial microwave facilities operating in the same frequency band. Indeed, the 1640 watt limit was established as part of the proceedings that updated that Commission RF safety regulations[22] and therefore it would be inappropriate to alter that threshold in the context of this proceeding.

V. Conclusion.

The Commission should retain the strict prohibition on independent operations of SDARS repeaters imposed in the STAs. Further, the Commission should require SDARs licensees to fully disclose the location, type and number of each terrestrial repeater in service and

[21] *See* OET Bulletin 65, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields,* Edition 97-01, Federal Communications Commission, Aug. 1997, at Appendix A.

[22] Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, *Report and Order*, ET Docket No. 93-62 (1996) at ¶¶ 90-91.

insure that all incumbent licensees are protected from blanketing interference. Finally, NAB urges the Commission to be consistent in the application of RF safety regulations.

Respectfully Submitted,

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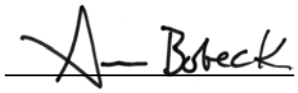

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